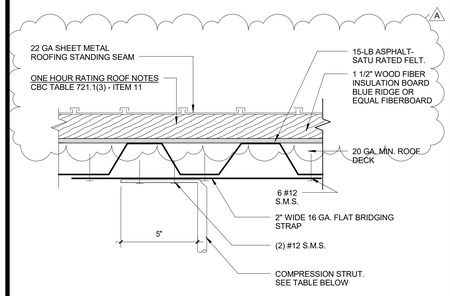
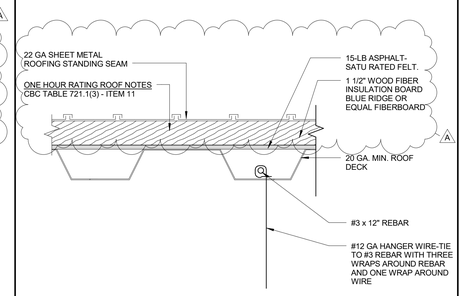
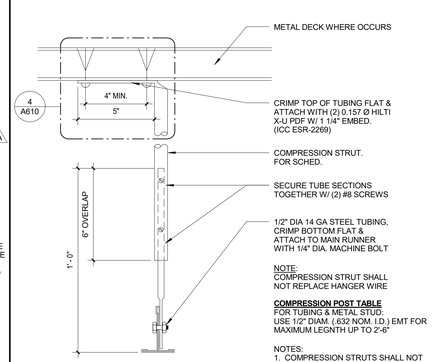


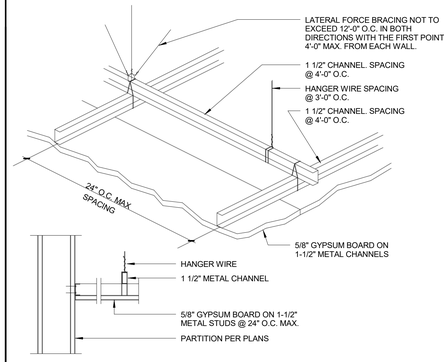
COMPRESSION STRUT @ ROOF DECK | 3" = 1'-0" | **4**



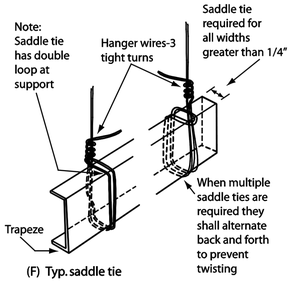
HANGER WIRE @ STEEL DECK | 3" = 1'-0" | **14**



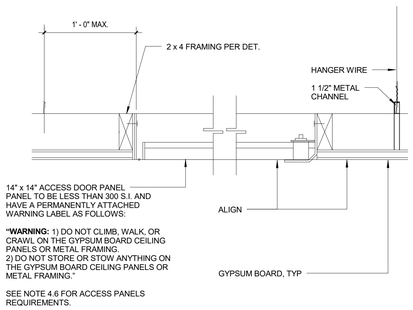
COMPRESSION STRUT @ GYP. BD. | 3" = 1'-0" | **2**



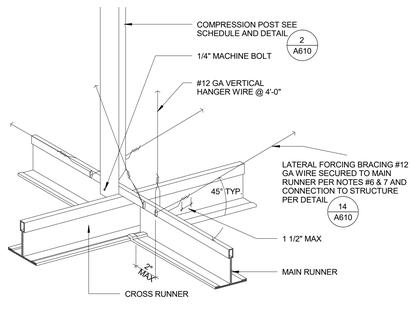
ALTERNATE GYP. BD. CEILING DETAIL | 1 1/2" = 1'-0" | **6**



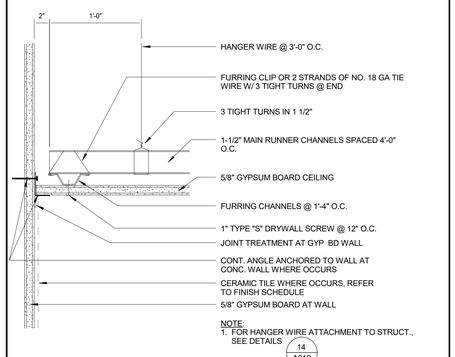
SADDLE TIE | 1/2" = 1'-0" | **12**



GYP. BD. CLG. @ ACCESS PANEL | 1 1/2" = 1'-0" | **13**



CEILING SPAY WIRE BRACING | 1 1/2" = 1'-0" | **8**



SUSP. GYP. BD. CLG. @ STUD WALL | 1 1/2" = 1'-0" | **5**

SUSPENDED GYPSUM BOARD CEILING SYSTEM PER CBC CHAPTER 25, CBC
TABLE 2506.2 AND DIVISION OF THE STATE ARCHITECT IR 25-3.13

1. MATERIALS: MATERIALS ARE TO COMPLY WITH CBC SECTION 2508 AND APPLICABLE ASTM STANDARDS. GYPSUM WALLBOARD IS EITHER 1/2 INCH OR 5/8 INCH IN THICKNESS. COLD-FORMED STEEL SECTIONS SPECIFIED IN THIS IR ARE IDENTIFIED BY A PRODUCT DESIGNATOR WHICH HAS BEEN STANDARDIZED BY THE AMERICAN IRON AND STEEL INSTITUTE (AISI) IN COLLABORATION WITH THE STEEL STUD MANUFACTURERS ASSOCIATION (SSMA).

2. DESIGN: THE PRESCRIPTIVE REQUIREMENTS OF THIS IR SHALL BE TAKEN AS THE MINIMUM REQUIREMENTS AND APPLY TO A CEILING THAT IS NOT ACCESSIBLE, HAS A SINGLE LAYER OF GYPSUM BOARD NOT EXCEEDING 5/8" THICK, AND HAS A TOTAL CEILING WEIGHT NOT TO EXCEED FOUR (4) POUNDS PER SQUARE FOOT (PSF). A CEILING THAT IS REQUIRED BY CCR TITLE 24 TO BE ACCESSIBLE, OR OTHERWISE DOES NOT MEET THESE LIMITATIONS, SHALL BE DESIGNED TO MEET THE APPLICABLE REQUIREMENTS OF CBC SECTIONS 1607A AND 2508.1, AND ASCE 7-10, SECTION 13.3.1.

DETAILS OF CONSTRUCTION:
3.1 GENERAL: GYPSUM BOARD CEILINGS SHALL NOT SUPPORT BUILDING COMPONENTS OTHER THAN AIR CONDITIONING/HEATING GRILLS OR LIGHT FIXTURES. ALL SUCH COMPONENTS SHALL BE SUPPORTED EITHER DIRECTLY FROM MAIN RUNNERS, OR BY SUPPLEMENTAL FRAMING WHICH IS SUPPORTED BY MAIN RUNNERS. NO VERTICAL LOADS OTHER THAN GYPSUM BOARD DEAD LOAD SHALL BE APPLIED TO CROSS-FURRING.
3.2 VERTICAL SUPPORT SYSTEM: THERE ARE MANY POSSIBLE VARIATIONS OF MAIN RUNNER SIZES, SPACINGS, AND SPANS LISTED IN ASTM C754-04, TABLE 7. ALL OF THE COMBINATIONS ARE ACCEPTABLE, PROVIDED THE MAIN RUNNER SPACING DOES NOT EXCEED 4'-0" AND THE CEILING AREA SUPPORTED BY A HANGER WIRE DOES NOT EXCEED 16 SQUARE FEET.
3.2.1 MAIN RUNNER SPACING AND SPAN: THE MAIN RUNNER MOST FREQUENTLY USED IS A 1-1/2 INCH COLD ROLLED CHANNEL DESIGNATED 150U50-54 (1-1/2 INCH COLD ROLLED CHANNELS WEIGHING 0.414 LBS/FT) SPACED NO MORE THAN 4'-0" O.C. WITH A HANGER WIRE SPACING NOT TO EXCEED 4'-0" O.C. AND NO MORE THAN 6" FROM EACH END OF THE MAIN RUNNER.
3.2.2 VERTICAL HANGER WIRES: CEILING WIRE SHALL BE CLASS 1 ZINC COATED (GALVANIZED) CARBON STEEL CONFORMING TO ASTM A641. WIRE SHALL BE #9 GAGE (0.148" DIAMETER) WITH SOFT TEMPER AND MINIMUM TENSILE STRENGTH = 70 KSI.
3.2.3 CROSS-FURRING: 7/8 INCH GALVANIZED STEEL HAT SECTIONS, DESIGNATED 087F125-18, AT 24 INCHES O.C. MAXIMUM.

3.3 CONNECTING HANGER WIRES, STEEL FRAMING AND FURRING:
3.3.1 HANGER WIRES SHALL BE SADDLE-TIED TO THE MAIN RUNNERS PER IR 25-2.13 FIGURE 3A(F).
3.3.2 CROSS FURRING SHALL BE SADDLE-TIED TO THE MAIN RUNNERS WITH AT LEAST ONE STRAND OF #16 GAGE, OR TWO STRANDS OF #18 GAGE TIE WIRE.
3.3.3 MAIN RUNNERS SHALL BE SPLICED BY LAPPING AND INTERLOCKING FLANGES AND INSTALLING TWO (2) #8 SCREWS AT EACH END OF SPLICE. THE LAP MUST BE A MINIMUM OF 12 INCHES LONG.
3.3.4 CROSS FURRING SHALL BE SPLICED BY LAPPING AND INTERLOCKING THE PIECES AND INSTALLING TWO (2) #8 SCREWS AT EACH END OF SPLICE. THE LAP MUST BE A MINIMUM OF EIGHT (8) INCHES LONG.

3.4 INSTALLATION AND ANCHORAGE OF HANGER AND BRACING WIRES: FASTEN HANGER WIRES WITH NOT LESS THAN THREE (3) TIGHT TURNS WITHIN A DISTANCE OF THREE INCHES. HANGER WIRE LOOPS SHALL BE TIGHTLY WRAPPED AND SHARPLY BENT TO PREVENT ANY VERTICAL MOVEMENT OR ROTATION OF THE MEMBER WITHIN THE LOOPS (SEE ASTM E580, SECTION 5.2.7.2). FASTEN BRACING WIRES WITH FOUR (4) TIGHT TURNS WITHIN A DISTANCE OF ONE AND ONE-HALF (1-1/2) INCHES. HANGER AND BRACING WIRE ANCHORS SHALL BE INSTALLED IN SUCH A MANNER THAT THE DIRECTION OF THE ANCHOR ALIGNS AS CLOSELY AS POSSIBLE WITH THE DIRECTION OF THE WIRE.
3.4.1 SEPARATE ALL CEILING HANGER AND BRACING WIRES AT LEAST SIX (6) INCHES FROM ALL UNBRACED DUCTS, PIPES, CONDUIT, ETC.
3.4.2 WHEN DRILLED-IN CONCRETE ANCHORS OR POWER ACTUATED FASTENERS ARE USED IN REINFORCED CONCRETE FOR HANGER WIRES, 1 OUT OF 10 MUST BE FIELD TESTED FOR 200 LBS. IN TENSION. WHEN DRILLED-IN CONCRETE ANCHORS ARE USED FOR BRACING WIRES, 1 OUT OF 2 MUST BE FIELD TESTED FOR 440 LBS IN TENSION. POWER ACTUATED FASTENERS IN CONCRETE ARE NOT PERMITTED FOR BRACING WIRES. IF ANY POWER ACTUATED FASTENER OR DRILLED-IN ANCHOR FAILS, SEE 2013 CBC SECTION 1913A.7.1 OR 1913.2.11.1*.

NOTE: DRILLED-IN ANCHORS OR POWER ACTUATED FASTENERS EMBEDMENT DEPTH SHALL BE LIMITED IN PRESTRESSED CONCRETE TO NOT IMPINGE TENSIONED REINFORCEMENT OR SPECIAL PROCEDURES SHALL BE DEVELOPED TO LOCATE AND CLEAR TENSIONED REINFORCEMENT.
3.4.3 PROVIDE TRAPEZE OR OTHER SUPPLEMENTARY SUPPORT MEMBERS AT OBSTRUCTIONS TO TYPICAL HANGER SPACING. PROVIDE ADDITIONAL HANGERS, STRUTS OR BRACES AS REQUIRED AT ALL CEILING BREAKS, SOFFITS OR DISCONTINUOUS AREAS. HANGER WIRES THAT ARE MORE THAN 1 IN 6 OUT OF PLUMB ARE TO HAVE COUNTER-SLOPING WIRES.

4. CEILING FIXTURES, TERMINALS, AND DEVICES:
4.1 ALL RECESSED OR DROP-IN LIGHT FIXTURES, AS WELL AS CEILING MOUNTED MECHANICAL AIR TERMINALS AND SERVICES, SHALL BE SUPPORTED DIRECTLY BY MAIN RUNNERS OR BY SUPPLEMENTAL FRAMING WHICH IS SUPPORTED BY MAIN RUNNERS AND POSITIVELY ATTACHED WITH SCREWS OR OTHER APPROVED CONNECTORS TO RESIST A HORIZONTAL FORCE EQUAL TO THE WEIGHT OF THE COMPONENT. A MINIMUM OF TWO ATTACHMENTS ARE REQUIRED AT EACH FIXTURE AND COMPONENT.
4.2 SURFACE MOUNTED FIXTURES SHALL BE ATTACHED TO A MAIN RUNNER WITH A POSITIVE CLAMPING DEVICE MADE OF MATERIAL WITH A MINIMUM OF 14 GAGE. ROTATIONAL SPRING CLAMPS DO NOT COMPLY.
4.3 LIGHT FIXTURES, GRILLES, MECHANICAL TERMINALS, AND FLEXIBLE SPRINKLER HOSE FITTINGS OR OTHER SERVICES WEIGHING GREATER THAN 20 LBS. MUST BE INDEPENDENTLY SUPPORTED BY NOT LESS THAN TWO (2) TAUT #12 GAGE WIRES WHERE LESS THAN 56 POUNDS, AND FOUR (4) TAUT #12 GAGE WIRES WHERE GREATER THAN OR EQUAL TO 56 POUNDS, AND ATTACHED TO THE HOUSING AND TO THE STRUCTURE ABOVE. THE WIRES, INCLUDING THEIR ATTACHMENT TO THE STRUCTURE ABOVE, MUST BE CAPABLE OF SUPPORTING FOUR (4) TIMES THE WEIGHT OF THE UNIT.
LIGHT FIXTURES AND HVAC DIFFUSERS SHALL HAVE SUPPLEMENTARY SUPPORTS AS REQUIRED, SEE DETAIL

4.4 ALL LIGHTWEIGHT MISCELLANEOUS DEVICES, SUCH AS STROBE LIGHTS, OCCUPANCY SENSORS, SPEAKERS, EXIT SIGNS, ETC., SHALL BE ATTACHED TO THE CEILING PER SECTION 4.1 OF THIS IR. DEVICES WEIGHING MORE THAN 20 LBS. SHALL BE SUPPORTED FROM THE STRUCTURE ABOVE PER SECTION 4.3 OF THIS IR.
4.5 PENETRATIONS THROUGH THE CEILING FOR SPRINKLER HEADS AND OTHER SIMILAR DEVICES THAT ARE NOT INTEGRALLY TIED TO THE CEILING SYSTEM IN THE LATERAL DIRECTION SHALL HAVE A TWO (2) INCH OVERSIZED RING, SLEEVE OR ADAPTER THROUGH THE CEILING TILE TO ALLOW FREE MOVEMENT OF ONE (1) INCH IN ALL HORIZONTAL DIRECTIONS. ALTERNATIVELY, PER ASTM E580, SECTION 5.2.8.5, A FLEXIBLE SPRINKLER HOSE FITTING THAT CAN ACCOMMODATE 1 INCH OF CEILING MOVEMENT SHALL BE PERMITTED TO BE USED IN LIEU OF THE OVERSIZED RING, SLEEVE, OR ADAPTER.
4.6 ACCESS PANELS: ACCESS TO THE SPACE BETWEEN THE CEILING AND THE FLOOR OR ROOF ABOVE SHALL NOT BE ALLOWED. SMALL ACCESS PANELS FOR THE INSPECTION, ADJUSTMENT OR REPAIR OF UTILITY SWITCHES, VALVES, SENSOR, ETC. MAY BE ALLOWED IF THE PANEL IS LESS THAN 300 SQUARE INCHES. SUCH PANELS SHALL ALSO HAVE A PERMANENTLY ATTACHED WARNING LABEL AS FOLLOWS:

"WARNING: 1) DO NOT CLIMB, WALK, OR CRAWL ON THE GYPSUM BOARD CEILING PANELS OR METAL FRAMING.
2) DO NOT STORE OR STOW ANYTHING ON THE GYPSUM BOARD CEILING PANELS OR METAL FRAMING."
IF FIRE FIGHTER ACCESS IS REQUIRED PER CBC SECTION 1209.2 IN ATTICS OF COMBUSTIBLE CONSTRUCTION, THE PRESCRIPTIVE SUSPENDED CEILING SYSTEM PRESCRIBED IN THIS IR IS NOT APPLICABLE, AND THE CEILING SHALL BE FRAMED AND DESIGNED FOR SUCH LOADING.

5. LATERAL FORCE BRACING ASSEMBLY INSTALLATION:

A) LATERAL FORCE BRACING ASSEMBLIES CONSISTING OF A COMPRESSION STRUT AND FOUR (4) #12 GAGE SPLAYED BRACING WIRES ORIENTED 90 DEGREES FROM EACH OTHER ARE REQUIRED FOR ALL CEILING AREAS.
EXCEPTION: LATERAL FORCE BRACING MAY BE OMITTED FOR SUSPENDED ACOUSTICAL CEILING SYSTEMS WITH A CEILING AREA NOT TO EXCEED 144 SQUARE FEET, FOR ALL VALUES OF SDS, WHEN PERIMETER SUPPORT IS PROVIDED IN ACCORDANCE WITH SECTION 2.2 OF THIS IR AND PERIMETER WALLS ARE DESIGNED TO CARRY THE CEILING LATERAL FORCES.

B) LATERAL FORCE BRACING ASSEMBLIES SHALL BE SPACED PER TABLE 1 FOR ALL VALUES OF THE COMPONENT IMPORTANCE FACTOR (IP) OF THE CEILING.

C) THERE SHALL BE A BRACE ASSEMBLY A DISTANCE OF NOT MORE THAN ONE HALF OF THE ABOVE SPACING FROM EACH SURROUNDING WALL, EXPANSION JOINT AND AT THE EDGES OF ANY CEILING VERTICAL OFFSET. FOR EXAMPLE, WHERE THE BRACE SPACING IS 8' X 12', THE EDGE DISTANCE SHALL BE 4 FEET IN THE DIRECTION OF THE 8 FOOT SPACING AND 6 FEET IN THE DIRECTION OF THE 12 FOOT SPACING.

D) THE SLOPE OF BRACING WIRES SHALL NOT EXCEED 45 DEGREES FROM THE HORIZONTAL PLANE AND WIRES SHALL BE TAUT. SPLICES IN BRACING WIRES SHALL DEVELOP THE WIRE ALLOWABLE LOAD.

E) COMPRESSION STRUTS SHALL MEET THE FOLLOWING REQUIREMENTS:
• THE STRUT SHALL BE SIZED TO ADEQUATELY RESIST THE VERTICAL COMPONENT FORCE INDUCED BY THE CEILING BRACING WIRES AND HAVE A MAXIMUM KL/R NOT TO EXCEED 300. THE STRUTS LISTED IN APPENDIX A MEET THIS REQUIREMENT FOR CEILINGS COMPLYING WITH THE GENERAL REQUIREMENTS OF THIS IR.
• THE STRUT SHALL NOT BE MORE THAN ONE (HORIZONTAL) IN SIX (VERTICAL) OUT OF PLUMB.

TABLE 1
LATERAL FORCE BRACE ASSEMBLY SPACING

Design Spectral Acceleration Parameter, S_{DS}	Brace Assembly Spacing (ft.)	
	z/h ≤ 0.5[a]	z/h > 0.5[a,b]
~~S_{DS} < 1.15~~	~~12 x 12~~	~~12 x 12~~
1.15 < S_{DS} ≤ 1.73	12 x 12	~~8 x 12~~
~~S_{DS} > 1.73~~	~~8 x 12~~	~~6 x 8~~

OWNER: EL MONTE UNION HIGH SCHOOL DISTRICT

PROJECT NAME: EL MONTE HIGH SCHOOL BLEACHERS

CLIENT ADDRESS: 3048 TYLER AVENUE, EL MONTE, CA, 91731

LICENSED ARCHITECT
ROBERT M. SIMONDS
No. C-13011
JAN. 31, 2019
STATE OF CALIFORNIA

IDENTIFICATION STAMP
DIVISION OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
A# **03-117117**
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DATE _____
FILE # **19-H10**

REVISIONS:

	DESCRIPTION	DATE
A	Addendum A	4-5-2017

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SUSPENDED CEILINGS

SVA ARCHITECTS
3 MacArthur Place, Suite 850 Santa Ana, CA 92707
T (949) 809-3380 WWW.SVA-ARCHITECTS.COM
SANTA ANA OAKLAND SAN DIEGO HONOLULU

CEILING NOTES (SUSPENDED GYP. BD)